

# Stream Flow, Water Conservation and Fish Communities

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# Quinebaug Mainstem Target Fish Community

**Pond Species**  
**25%**

**Fluvial Dependant**  
**25%**

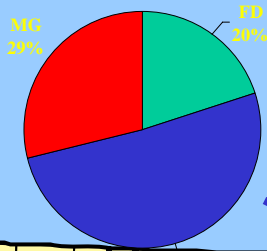
**Fluvial Specialists**  
**50%**

“Rivers Should  
Have River Fish  
Communities”

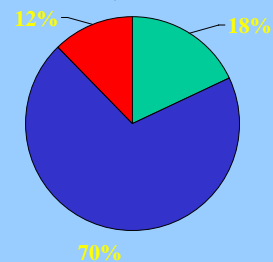
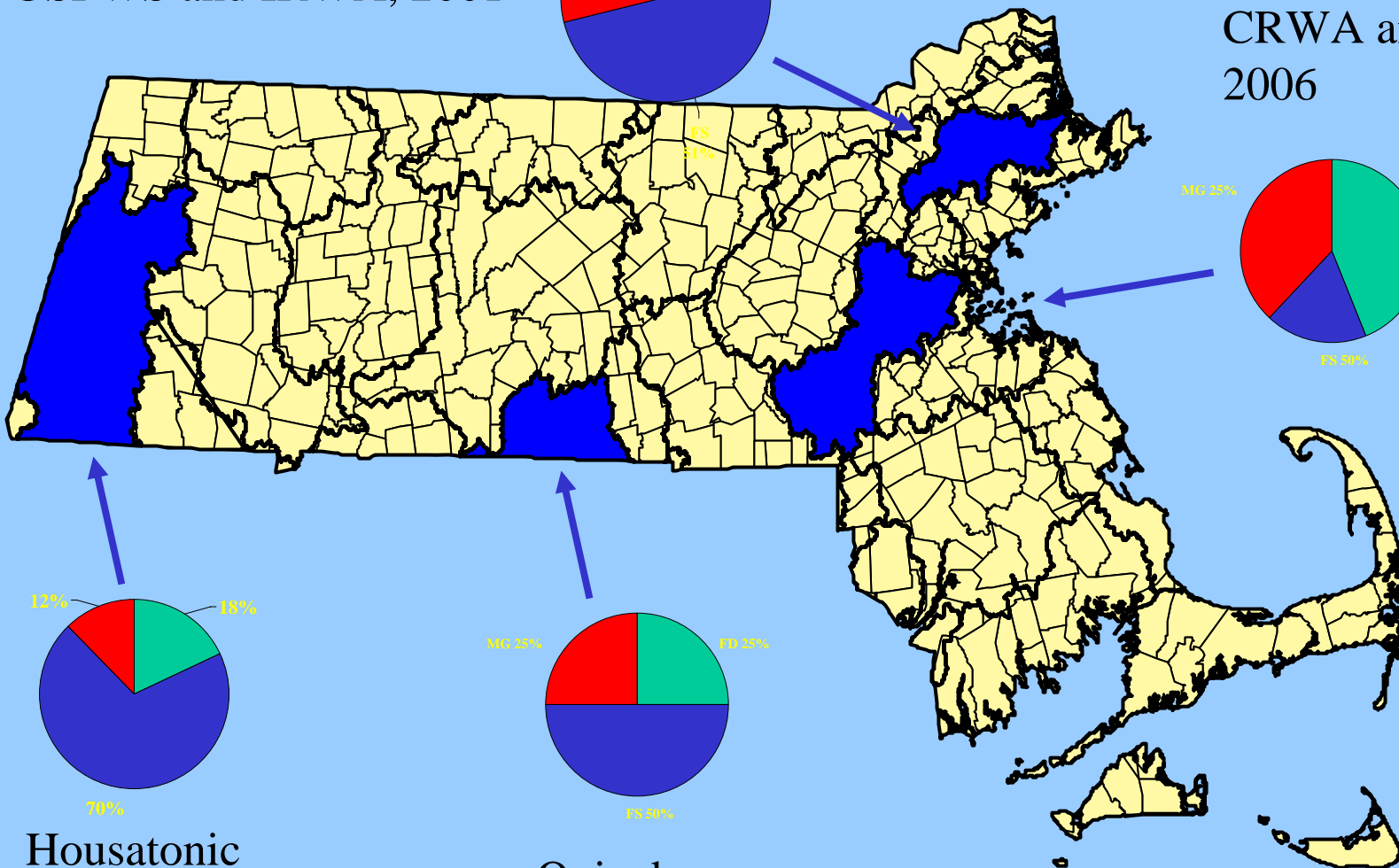
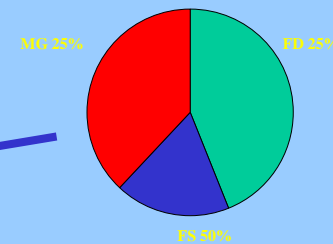
Expected Condition  
When Biological  
Integrity is Maintained

# Completed Target Fish Communities

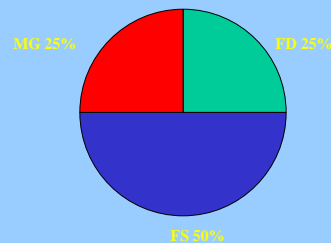
Ipswich  
USFWS and IRWA, 2001



Charles  
CRWA and Cornell,  
2006

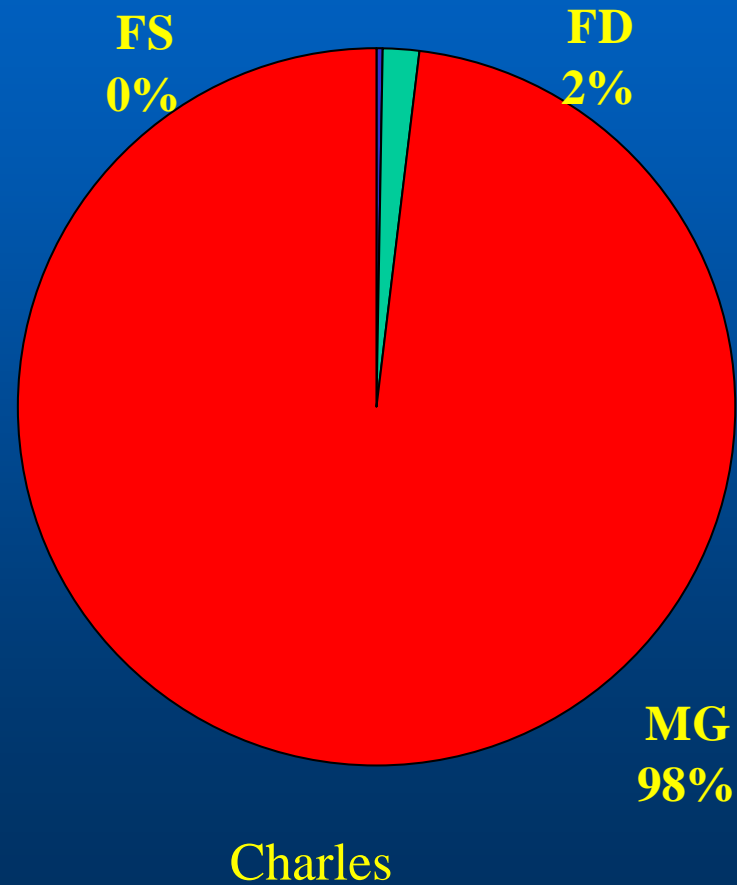
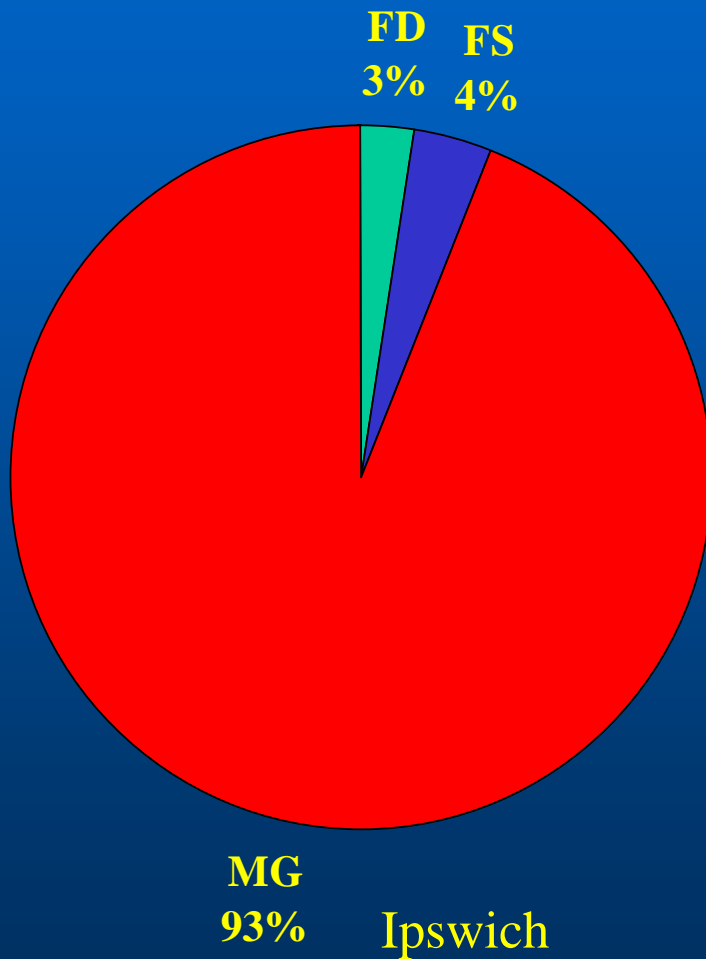


Housatonic  
MA Riverways 2004

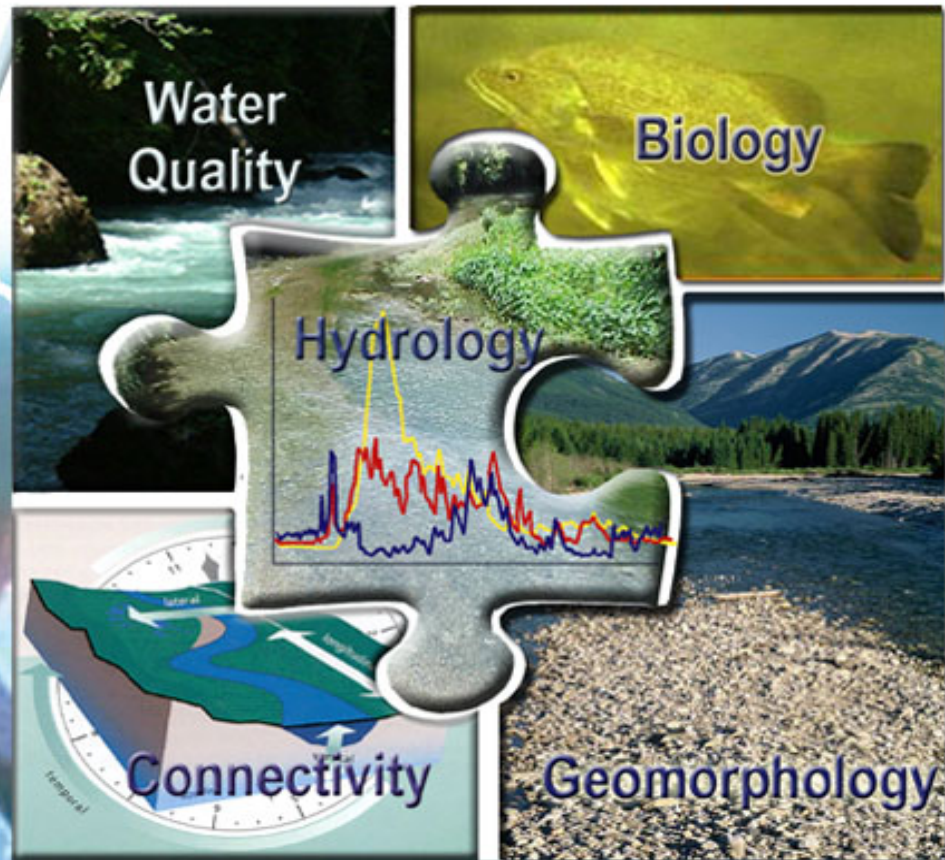


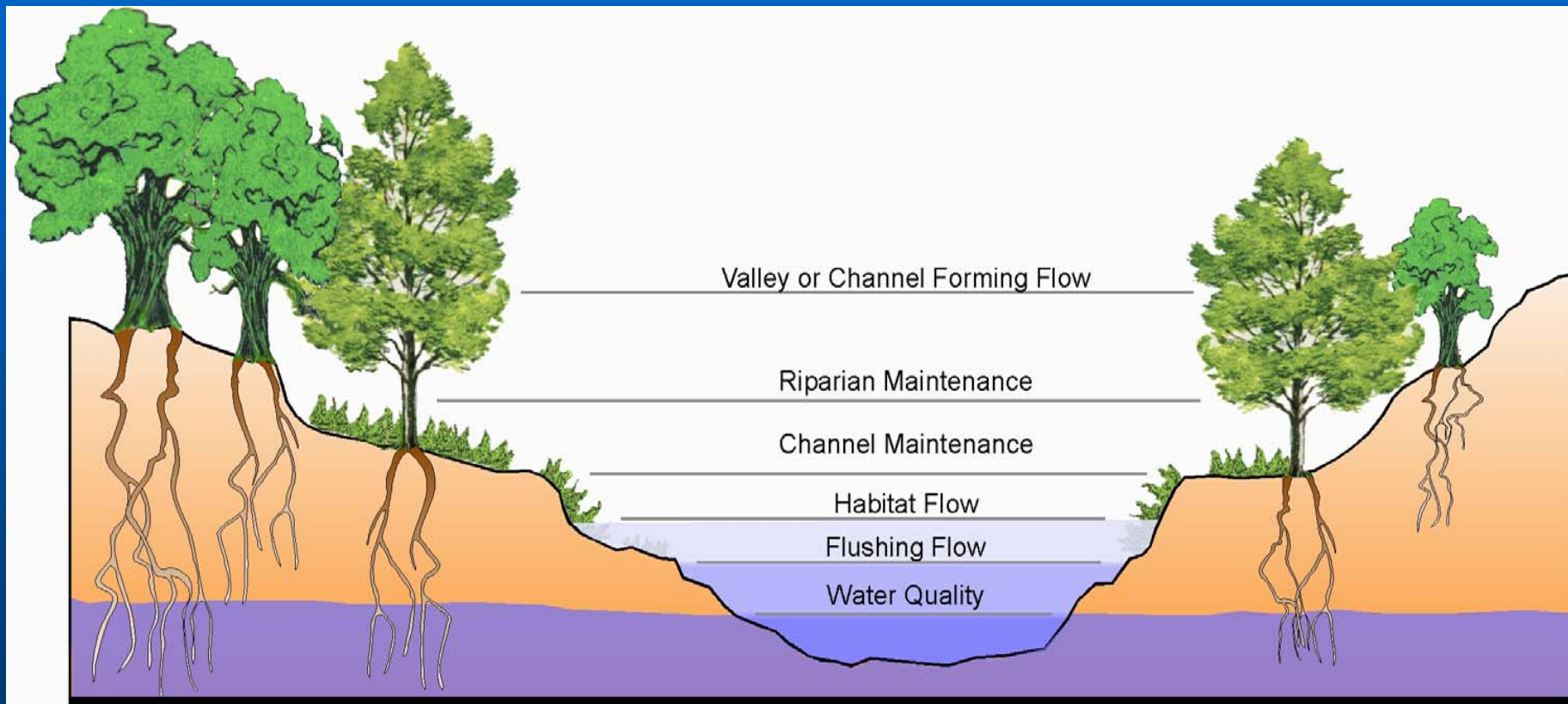
Quinebaug  
Cornell, 2000

# Watersheds in Trouble



# Riverine Components





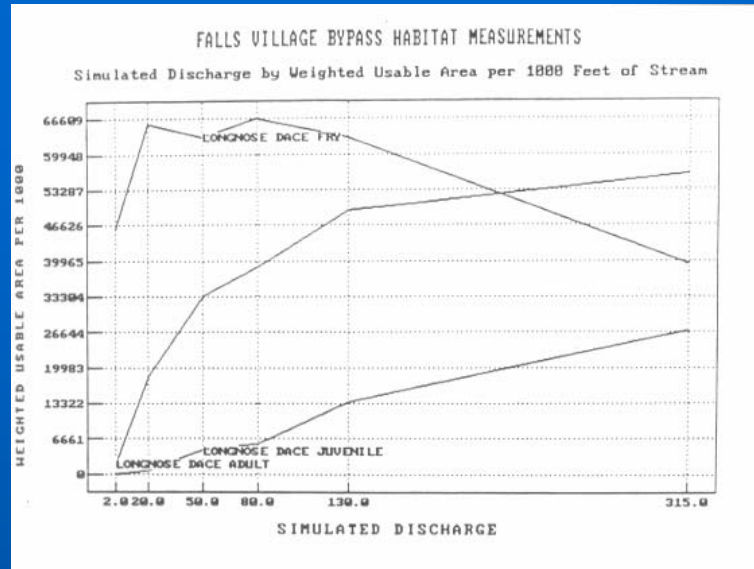
# Hydrologic Impacts



## Habitat Impacts



## Aquatic Community Impacts



# Fish Community Assessment: Identifying the Current Status

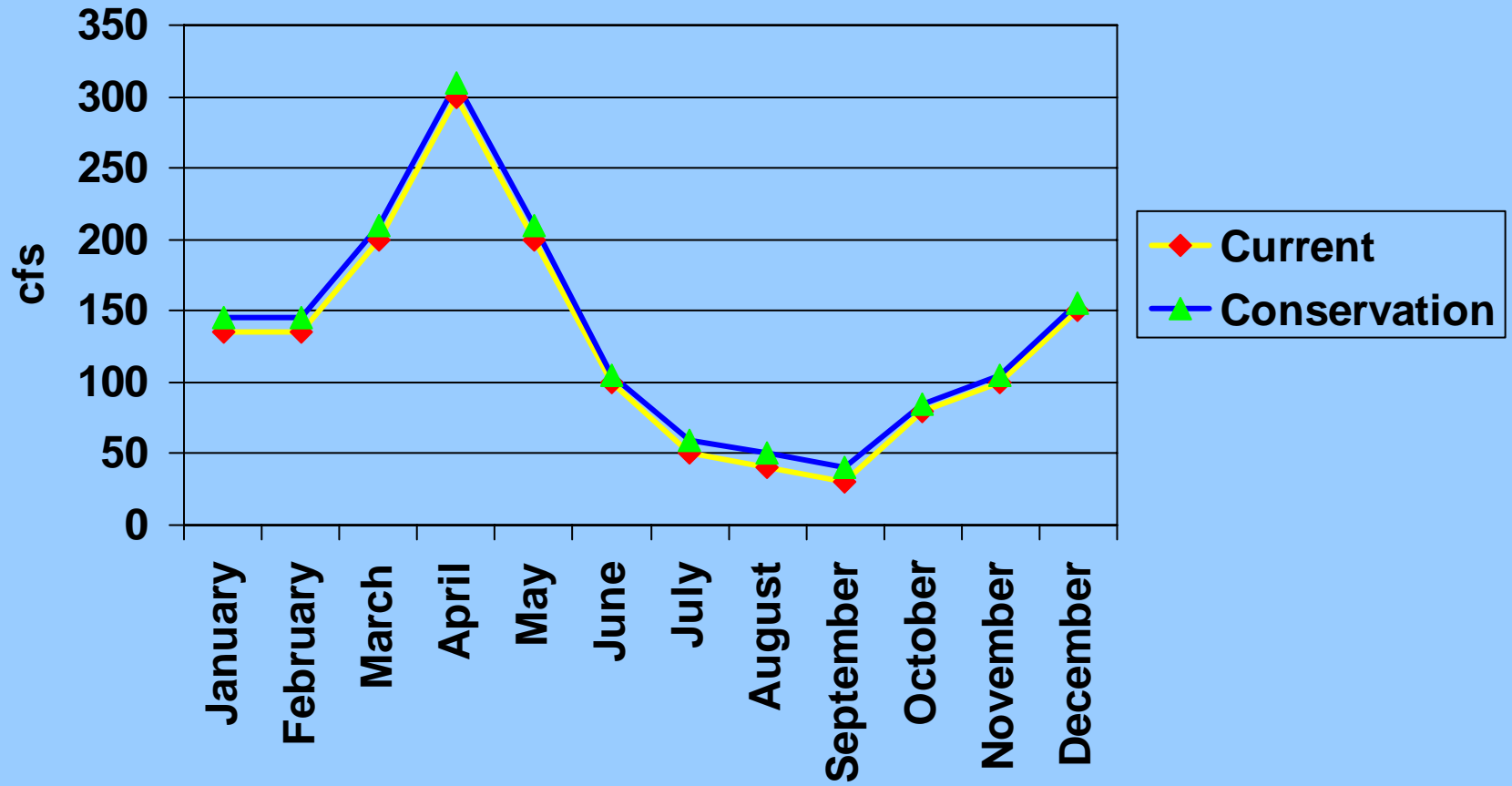
- The Fish Tell the Story
  - Long-Lived
  - Reflect Stresses Over Time
  - Easily Recognized and Identified



# Fish Community Impacts

- Species Diversity
- Biomass
- Abundance
- Age and Size Structure
- Fluvial Fish Community

# Annual Hydrograph

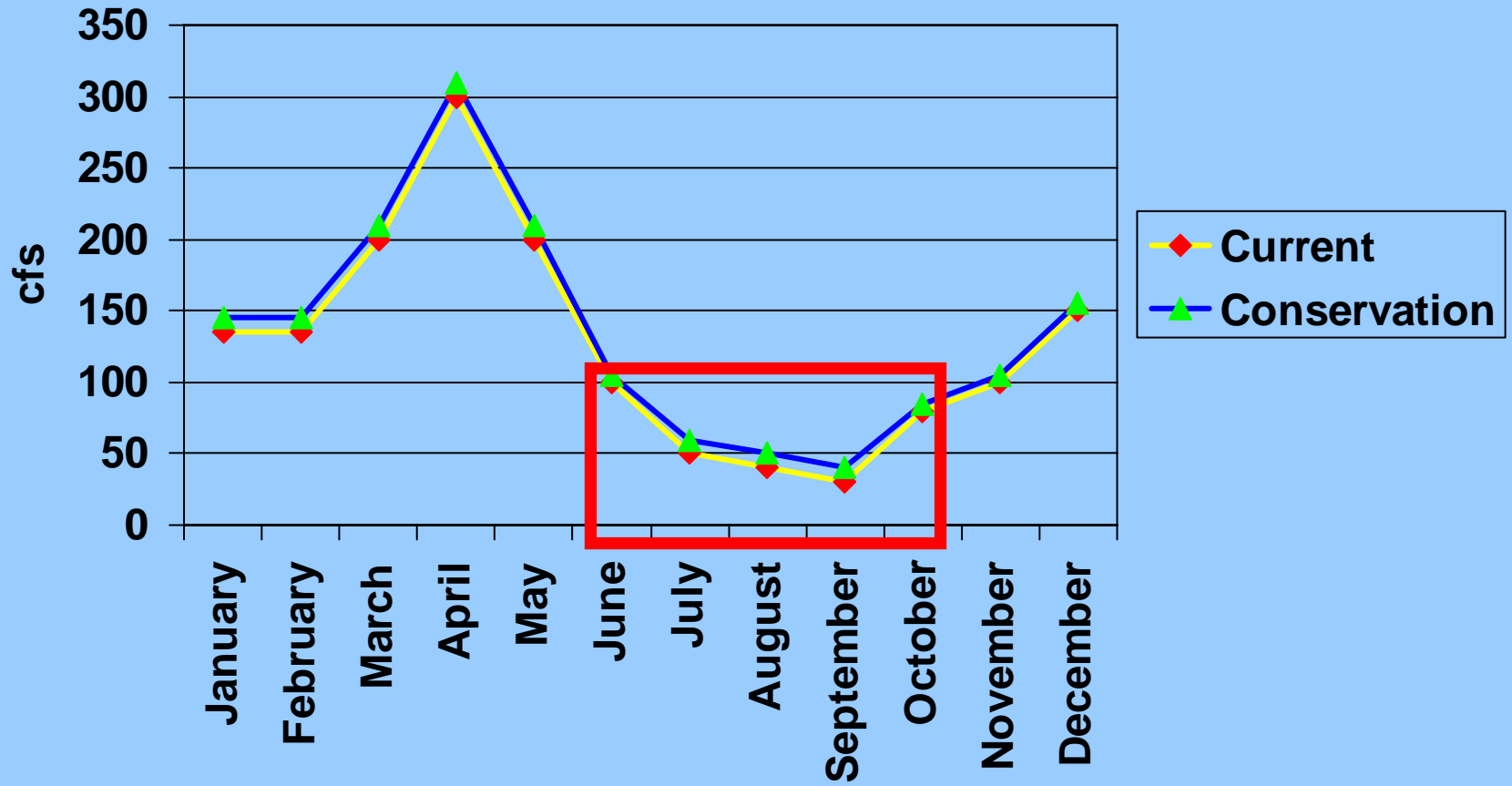


# Summer Hydrograph

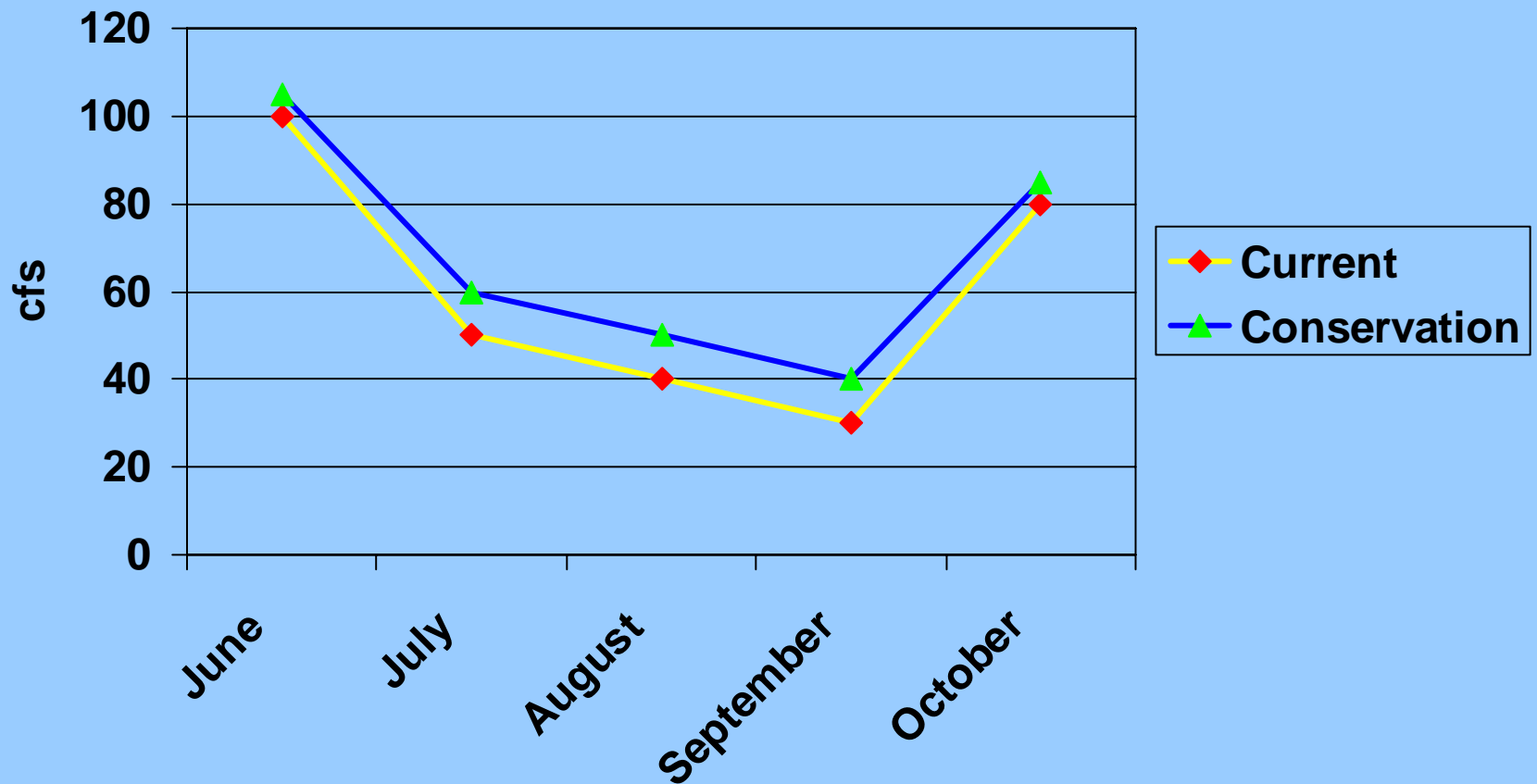
- Critical for all Riverine Fish Species
- Naturally the Most Extreme and Limiting Time Period
- Small Changes in Flow Lead to Large Community Changes

Small Improvements to the Summer Hydrograph Help to Maintain Natural Fish Communities

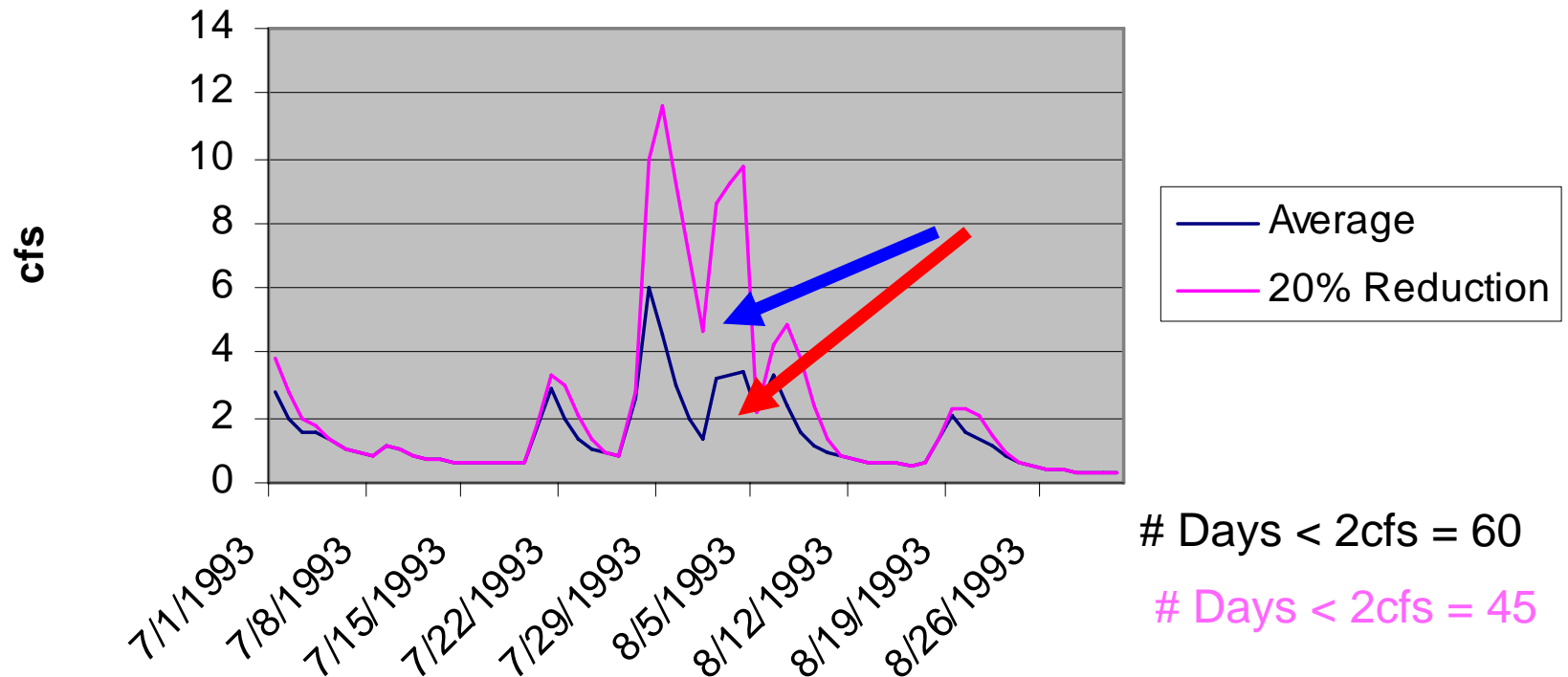
# Critical Summer Period



# Critical Summer Period



# Critical Summer Period



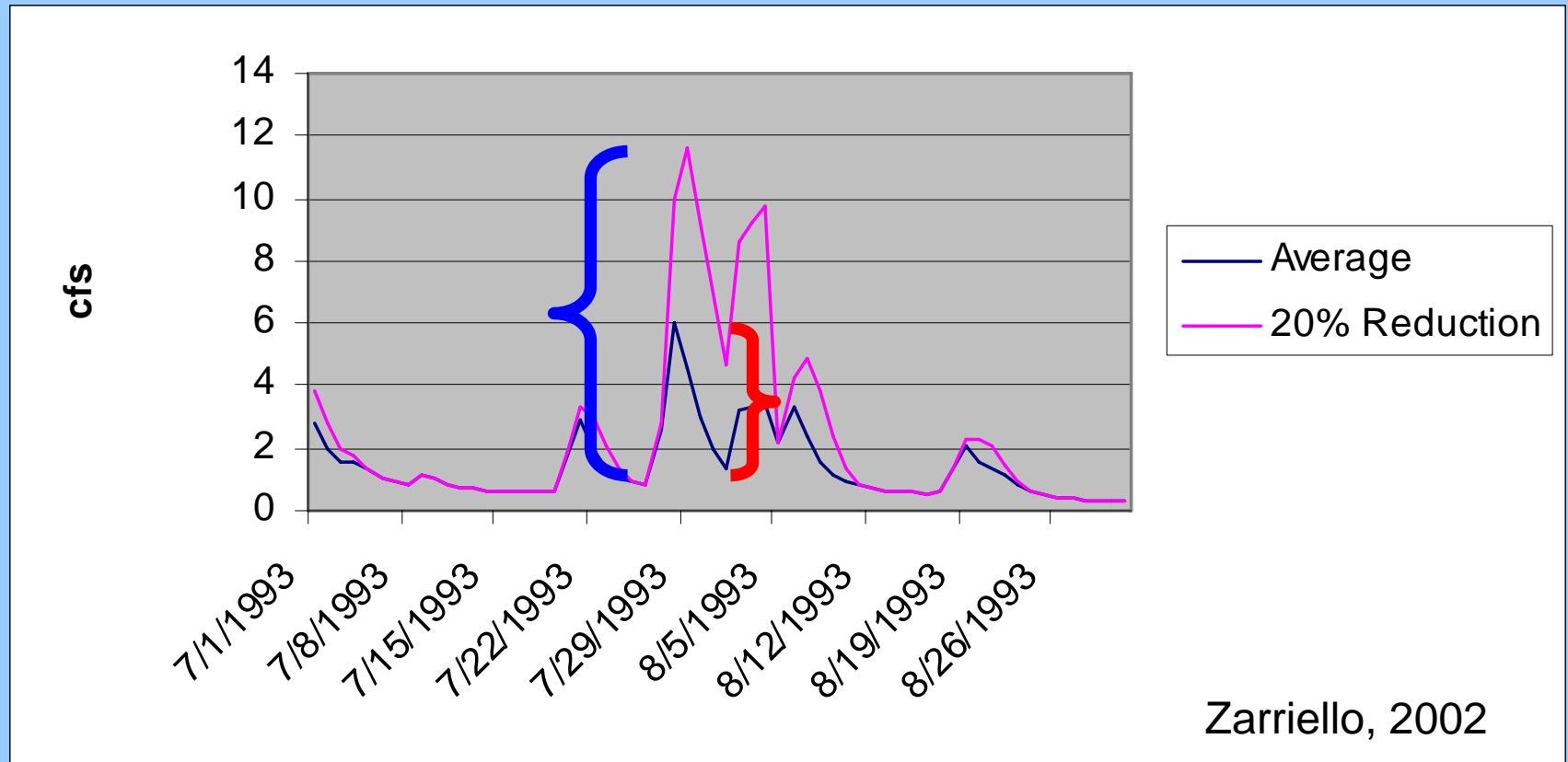
# Days < 2cfs = 60

# Days < 2cfs = 45

Zarriello, 2002

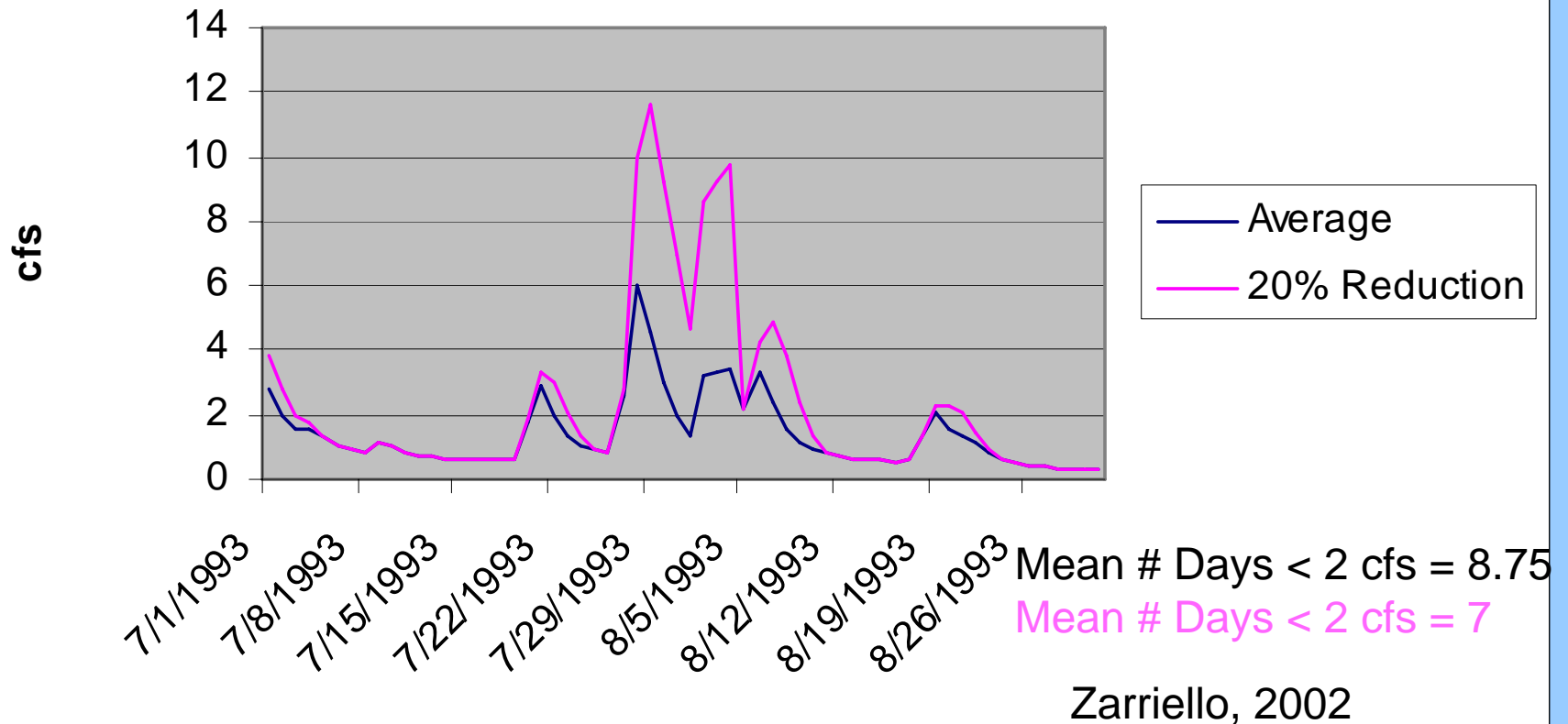
Reduced Frequency of Extreme Low Flow Events

# Critical Summer Period



Increased Magnitude of Low Flow Events

# Critical Summer Period



Reduced Duration of Low Flow Events

# Summary

- Fisheries Resources Are Impacted To Some Extent Statewide
- Water Withdrawal Has Been Documented by the USGS to be One Critical Impacts (Zarriello, 2002)
- Summer Hydrology is Critical
- The Low Flow Hydrograph Will Benefit Most From Conservation
- Fish Communities Will Respond to Conservation Methods